DWR
CCTAG
Subgroup - Scenarios

July 10, 2013

California Department of Water Resources
Climate Change Technical Advisory Subgroup Meeting
9am to 12pm, July 10, 2013
Bonderson 213-A, IRWM conference room (the smaller conference room near Sandy Layne's desk)

PHONE LINE: 1-877-921-8126, Participant Code: 2226805
WEBEX:
https://resources.webex.com/mw0306ld/mywebex/default.do?service=1&main_url=%2Fmc0805ld%2Fe.do%3Fsiteurl%3Dresources%26AT%3DMI%26EventID%3D26970858%26Host%3D47c393cf1d2d43052e3d27&siteurl=resources

MEETING GOALS and OBJECTIVES:
Delve further into specifics for road map for establishing general planning climate change scenarios. Set up future subgroup meetings.

- **Review Scenarios selection flow chart**
- **Open Discussion: Step 2**
  - **Vulnerabilities and Variables charts**
  - **Decision Support Tool approach?**
- **Flood separate (Mike A. leading, not available at today's meeting)**
- **Plan for CCTAG full meeting report-out and work session (Aug 23 or Sept 4)**
- **Next meeting, and frequency of Subgroup (standing?) meetings**

CCTAG 4-25-13 Road Map to Scenario Selection (Draft)

Step 1. Filter latest suite of GCMs* for those that do not produce reasonable regional climatologies and distributions of regional anomalies for temperature and precipitation.

This will probably be done using the methodology proposed by Mote and Rupe @USGS/CSC currently in draft. Needs to be reviewed by CCTAG/DWR.

Culled GCMs (not used/discarded)

Eg. Step 3 table indicates that 15 GCMs are effective for evaluating vulnerability X. However agency A doesn't have the resources to run 15 x 3 emissions scenarios. For their purpose, evaluating the likely range of potential futures and median impact are most useful. How can they compress the 15x3 runs down to 3-5?

Remaining GCMs

Step 2. Attempt to further refine suite of GCMs for each specific type of water manage analysis using:
1) a decision support tool comparing observed historical and simulated historical periods
or
2) selecting GCMs that do the best job of simulating the most important variables for the specified analysis.

Identify the most important variables for a given management analysis/climate vulnerability and select GCMs that provide best performance for those variables.

	Var #1	Var #2	Var #3	Var #4	Var #5
Vulnerability #1		x		x	
Vulnerability #2	x	x			x
Vulnerability #3		x		x	x
Vulnerability #4			x	x	

Step 3. Develop matrix table of vulnerabilities and GCMs

Water management vulnerabilities to climate
Or
Climate vulnerabilities to water management

	GCM #1	GCM #2	GCM #3	GCM #4	GCM #5
Vulnerability #1	x	x			
Vulnerability #2	x	x	x		
Vulnerability #3				x	x
Vulnerability #4			x		

Step 4. Develop recommendations/ methodologies for compressing or reducing the number of individual GCM runs for specific applications

* Coupled Model Intercomparison Project Phase 5 (CMIP5)

GCM/Rainfall-Runoff Model Output Variables									
Climate Change Vulnerabilities	Streamflow	20-year ave precip	Storm-Track (500-hPa)	AR Events	Average Daily Temp	Average Daily High Temp	Average Daily Low Temp	Number of Frost Days	
Groundwater levels									
Surface Water Deliveries									
Water Demand									
Wildfires									
Droughts									
Carryover storage									
Runoff timing									
Flood metrics?									
Delta Salinity									
Water temperature									
Agricultural Productivity									

GCM's that have high skill at simulating specific water management vulnerabilities										
Water Mgmt Vulnerabilities to Climate Change	**HadGEM2**	**HadCM3**	**CanESM2**	**CNRM-CM5**	**GISS-E2-H**	**GISS-E2-R**	**NorESM1-M**	**CCSM4**	**CSIRO-Mk3**	**MRI-CGCM3**
Groundwater levels										
Surface Water Deliveries										
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Runoff timing										
Flood metrics?										
Delta Salinity										
Water temperature										
Agricultural Productivity										
Hydropower										

Water Mgmt Vulnerabilities to Climate Change	Model	Key GCM Output Needed
Analyses of Primary Importance		
Surface Water Supply Reliability		
Streamflow	Rainfall-runoff	Downscaled T, P, H
Surface Water Deliveries	Operations	Downscaled T, P, H via R-R
Carryover Storage	Operations	Downscaled T, P, H via R-R
Runoff Timing	Rainfall-runoff	Downscaled T, P, H
Delta Salinity	ANN+Operations	Downscaled T, P, H via R-R + SLR
Environmental Flows		
Streamflow	Rainfall-runoff	Downscaled T, P, H
Reservoir temperature	Rainfall-runoff+ Res	Downscaled T, P, H
Carryover storage	Operations	Downscaled T, P, H via R-R
Air temp	GCM	Downscaled T
Groundwater Conditions	Groundwater model	Downscaled T, P, H, Runoff
Hydropower		
Streamflow	Rainfall-runoff	Downscaled T, P, H
Carryover storage	Operations	Downscaled T, P, H via R-R
Water Demand (Ag and Urban)	Land Use Model	Downscaled T, P, H
Analyses of Secondary Importance		
Wildfire	Wildfire model	Downscaled T, P, H, W_s, etc.
Agricultural Productivity	Ag Productivity	Downscaled T_{ave}, T_{max}, T_{min}, P, H, etc.
Others		
Ecosystem Services	Multiple	Varies

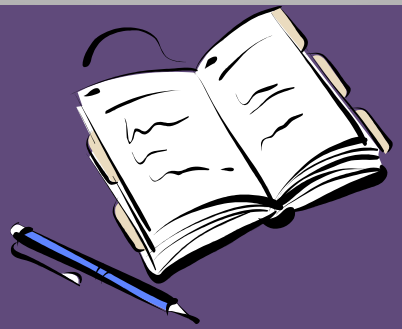
Precip intensity
Precip duration
Antecedent soil moisture
Maximum flows (3, 7, 10 day)

Analyses of Secondary Importance
Wildfire
Agricultural Productivity
Others
Ecosystem Services

Climate Scenarios Subgroup

Set next Webinar date

And Frequency of Meetings



THANK YOU!